

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendment, claims 13, 14, 16, 18, 20, 21 and 53 are pending in the application, with claim 13 being the independent claim. Claim 13 is sought to be amended. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Information Disclosure Statements

In the most recent Office Action, the Examiner indicated that certain documents submitted by Applicant with the Information Disclosure Statements filed on October 7, 2003, October 29, 2003 and November 14, 2003 were "not available for examination." However, during a telephone call between the undersigned and the Examiner on November 13, 2003, the Examiner indicated that he has subsequently received all the cited documents in electronic form. Accordingly, Applicant respectfully requests that the Examiner consider these references in view of the pending claims. Applicant further respectfully requests that the Examiner provide Applicant with a paper indicating acknowledgement of same.

Drawings

In the most recent office action, the Examiner stated that new drawings are required in the application because the figures do not reflect the claimed invention. Applicant respectfully disagrees. By way of example, FIG. 10(d) and the accompanying descriptive text at pages 36-44 of the present application illustrate an embodiment of the claimed invention. If there are particular elements in the pending claims which the Examiner believes are not reflected in FIG. 10(d) and the accompanying text, Applicant respectfully requests that the Examiner indicate with particularity which elements in the pending claims are not present so that Applicant may more fully respond.

Rejections under 35 U.S.C. § 112

The Examiner has rejected claims 13, 14, 16, 18, 20, 21 and 53 under 35 U.S.C. § 112, second paragraph, as being indefinite, vague, and confusing for failing to particularly point out and distinctly claim the subject matter which Applicant regards as his invention. In particular, the Examiner rejected claim 13 because "[i]t is vague and indefinite as to the structure and relationship of the buffer region between the said substrate and semiconductor layers"; "[i]t is not clear if the buffer region is on top or bottom of gallium nitride semiconductor layers, or if it is interposed only in a specific region in between substrate and semiconductor"; and "there is insufficient means, structure and functional relationship, which render the claims vague and indefinite." The Examiner further rejected dependent claims 14, 16, 18, 20, 21 and 53 for the same reasons. Applicant will address these issues below.

With regard to structure, Applicant respectfully submits that the claims are sufficiently clear. Claim 13 recites, in pertinent part:

gallium nitride type compound semiconductor layers forming a light emitting portion, said semiconductor layers including at least an n-type layer and a p-type layer, a band gap energy of the p-type layer being greater than a band gap energy of the n-type layer, ***said semiconductor layers being between said electrode and said substrate; and***
a buffer region interposed between said substrate and said semiconductor layers, said buffer region alleviating strain resulting from a lattice mismatch between said substrate and said semiconductor layers, wherein said buffer region comprises a first layer, said first layer including In.

(emphasis added). Thus, according to the plain language of claim 13, the inventive semiconductor light emitting device includes gallium nitride type compound semiconductor layers that are located somewhere in between the electrode and the substrate, and a buffer region that is located somewhere in between the substrate and the gallium nitride type compound semiconductor layers. Although this claim language may be broad, it is not unclear as to the relative locations of the claim elements. Given the clarity of this recitation, there should be no need to amend the claim to recite additional structure and/or structural relationships. For example, there is no need to refer to a "top" or "bottom" of the gallium nitride type compound semiconductor layers as suggested by the Examiner. Furthermore, Applicant does not seek to limit the invention to having a buffer region that is interposed "only in a specific region" between the substrate and semiconductor layers as suggested by the Examiner, and thus should not be required to so limit his claim.

With regard to function, Applicant has amended claim 13 to recite that the buffer layer "alleviat[es] strain resulting from a lattice mismatch between said substrate and said semiconductor layers." This claim language provides additional detail concerning

the functional relationship between the buffer layer, the substrate, and the semiconductor layers, and finds support, for example, at pages 40-41 of the present application.

In view of the foregoing, Applicant respectfully submits that claims 13, 14, 16, 18, 20, 21 and 53 particularly point out and distinctly claim the subject matter which Applicant regards as his invention in accordance with 35 U.S.C. § 112, second paragraph. Therefore, Applicant respectfully requests that the Examiner's rejection of claims 13, 14, 16, 18, 20, 21 and 53 under 35 U.S.C. § 112, second paragraph, be reconsidered and withdrawn.

Rejections under 35 U.S.C. § 102

The Examiner has rejected claim 13 under 35 U.S.C. § 102(b) as anticipated by each of U.S. Patent No. 5,585,649 to Ishikawa *et al.* ("Ishikawa"), U.S. Patent No. 5,578,839 to Nakamura *et al.* ("Nakamura '839 patent"), U.S. Patent No. 5,734,182 to Nakamura *et al.* ("Nakamura '182 patent"), and U.S. Patent No. 5,557,115 to Shakuda ("Shakuda"). Based on the foregoing claim amendments and the following remarks, Applicant respectfully traverses.

As an initial matter, Applicant notes that Ishikawa and Shakuda do not appear to be prior art to the present application. The present application claims priority to several Japanese Applications, each of which was filed in September, 1994. Ishikawa has a prior art date under 35 U.S.C. §§ 102(a) and 102(b) of December 17, 1996 and a prior art date under 35 U.S.C. § 102(e) of March 14, 1995. Shakuda has a prior art date under 35 U.S.C. §§ 102(a) and 102(b) of September 17, 1996 and a prior art date under 35 U.S.C.

§ 102(e) of August 10, 1995¹. Thus, Ishikawa and Shakuda are not prior art and cannot be used as a basis for a rejection of the claimed subject matter under 35 U.S.C. § 102. Accordingly, the Examiner's rejection of claim 13 as anticipated by Ishikawa and Shakuda is traversed and Applicant respectfully requests that these rejections be reconsidered and withdrawn.

The Nakamura '839 patent has a prior art date under 35 U.S.C. §§ 102(a) and 102(b) of November 26, 1996 and the Nakamura '182 patent has a prior art date under 35 U.S.C. §§ 102(a) and 102(b) of March 31, 1998. Consequently, the Nakamura '839 patent and the Nakamura '182 patent are not prior art under 35 U.S.C. § 102(b). Thus, for the purposes of this response, Applicant will assume that the Examiner intended to reject the pending claims as anticipated by the Nakamura '839 patent and the Nakamura '182 patent under 35 U.S.C. § 102(e).

Claim 13, as currently amended, recites:

A semiconductor light emitting device comprising:
an electrode;
a substrate;
gallium nitride type compound semiconductor layers forming a light emitting portion, said semiconductor layers including at least an n-type layer and a p-type layer, a band gap energy of the p-type layer being greater than a band gap energy of the n-type layer, said semiconductor layers being between said electrode and said substrate; and
a buffer region interposed between said substrate and said semiconductor layers, said buffer region alleviating strain resulting from a lattice mismatch between said substrate and said semiconductor layers, wherein said buffer region comprises a first layer, said first layer including In.

Neither the Nakamura '839 patent nor the Nakamura '182 patent teaches or suggests each

¹ Also, Shakuda is not available as a prior art reference under 35 U.S.C. § 102(e) because it has the same inventive entity as the present application.

of the foregoing features. For example, neither the Nakamura '839 patent nor the Nakamura '182 patent teaches or suggests "gallium nitride type compound semiconductor layers forming a light emitting portion, said semiconductor layers including at least an n-type layer and a p-type layer, a band gap energy of the p-type layer being greater than a band gap energy of the n-type layer" as recited by claim 13.

Because neither the Nakamura '839 patent nor the Nakamura '182 patent teaches or suggests each and every element of claim 13, these references cannot anticipate that claim. Accordingly, the Examiner's rejection of claim 13 as anticipated by the Nakamura '839 patent and the Nakamura '182 patent is traversed and Applicant respectfully requests that these rejections be reconsidered and withdrawn.

Rejections under 35 U.S.C. § 103

The Examiner has rejected claims 14, 16, 18, 20, 21, and 53 under 35 U.S.C. § 103(a) as being unpatentable over each of Ishikawa, the Nakamura '839 patent, the Nakamura '182 patent, and Shakuda. Based on the foregoing claim amendments and the following remarks, Applicant respectfully traverses.

As noted above, neither Ishikawa or Shakuda are prior art to the present application. Thus, these references cannot be used as a basis for a rejection of the claimed subject matter under 35 U.S.C. § 103(a). Accordingly, the Examiner's rejection of claims 14, 16, 18, 20, 21, and 53 as rendered obvious by each of Ishikawa and Shakuda is traversed and Applicant respectfully requests that these rejections be withdrawn.

The rejections of claims 14, 16, 18, 20, 21 and 53 under 35 U.S.C. § 103(a) over the Nakamura '839 patent and the Nakamura '182 patent will now be addressed. Claim 13, as currently amended, recites:

A semiconductor light emitting device comprising:
an electrode;
a substrate;
gallium nitride type compound semiconductor layers forming a light emitting portion, said semiconductor layers including at least an n-type layer and a p-type layer, a band gap energy of the p-type layer being greater than a band gap energy of the n-type layer, said semiconductor layers being between said electrode and said substrate; and
a buffer region interposed between said substrate and said semiconductor layers, said buffer region alleviating strain resulting from a lattice mismatch between said substrate and said semiconductor layers, wherein said buffer region comprises a first layer, said first layer including In.

Neither the Nakamura '839 patent nor the Nakamura '182 patent, alone or in combination, teaches or suggests each of the foregoing features. For example, neither the Nakamura '839 patent nor the Nakamura '182 patent, alone or in combination, teaches or suggests "gallium nitride type compound semiconductor layers forming a light emitting portion, said semiconductor layers including at least an n-type layer and a p-type layer, a band gap energy of the p-type layer being greater than a band gap energy of the n-type layer" as recited by claim 13.

Since the foregoing feature is present in each of dependent claims 14, 16, 18, 20, 21 and 53 and since the Nakamura '839 patent and the Nakamura '182, alone or in combination, do not teach or suggest the feature, those references cannot render claims 14, 16, 18, 20, 21 and 53 obvious under 35 U.S.C. § 103(a). Accordingly, the Examiner's rejection of these claims as rendered obvious by the Nakamura '839 patent

and the Nakamura '182 patent is traversed and Applicant respectfully requests that these rejections be reconsidered and withdrawn.

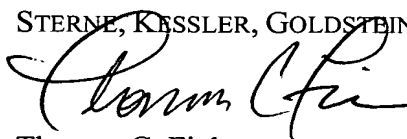
Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all presently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Amendment and Reply is respectfully requested.

Respectfully submitted,

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